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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**ATTORNEY DOCKET NO. 027053-0107**

Applicant: Angela BELCHER et al.  
Title: PEPTIDE MEDIATED SYNTHESIS OF METALLIC AND  
MAGNETIC MATERIALS  
Appl. No.: 10/665,721  
Filing Date: 09/22/2003  
Examiner: Unassigned  
Art Unit: 1651

**INFORMATION DISCLOSURE STATEMENT**  
**UNDER 37 CFR §1.56**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Submitted herewith on Form PTO/SB/08 is a listing of documents known to Applicants in order to comply with Applicants' duty of disclosure pursuant to 37 CFR §1.56. A copy of each non-U.S. patent document and each non-patent document is being submitted to comply with the provisions of 37 CFR §1.97 and §1.98.

The submission of any document herewith, which is not a statutory bar, is not intended as an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document which is determined to be a *prima facie* art reference against the claims of the present application.

**TIMING OF THE DISCLOSURE**

The listed documents are being submitted in compliance with 37 CFR §1.97(b), before the mailing date of the first Office Action on the merits.

**RELEVANCE OF EACH DOCUMENT**

All of the documents are in English.

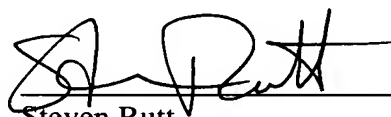
Applicants respectfully request that any listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 CFR §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Respectfully submitted,

January 28, 2005  
Date

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Attorney for Applicant  
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Substitute for form 1449B/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		Application Number	10/665,721
		Filing Date	09/22/2003
		First Named Inventor	Angela M. BELCHER et al.
		Group Art Unit	1651
		Examiner Name	Unassigned
Sheet 1 of 7	Attorney Docket Number	027053-0107	

## U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code <sup>2</sup> (if known)			
	B1	5,262,176		PALMACCI et al.	11/16/1993	
	B2	2003/0068900		BELCHER et al.	04/10/2003	
	B3	2003/0073104		BELCHER et al.	04/17/2003	
	B4	2003/0113714		BELCHER et al.	06/19/2003	
	B5	2003/0148380		BELCHER et al.	08/07/2003	
	B6	2004/0171139		BELCHER et al.	09/02/2004	

## FOREIGN PATENT DOCUMENTS

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		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)				
	B7	WO	2003/078451		NAIK et al.	09/25/2003		
	B8	WO	2004/033488		BELCHER et al.	04/22/2004		

## NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>6</sup>
	B9	BELCHER et al., "Control of Crystal Phase Switching and Orientation by Soluble Mollusc-Shell Proteins," Letters to Nature, Vol. 381, May 2, 1996, pp. 56-58.	
	B10	BROTT et al., "Ultrafast Holographic Nanopatterning of Biocatalytically Formed Silica," Letters to Nature, Vol. 413, September 2001, pp. 291-293.	
	B11	BROWN et al., "A Genetic Analysis of Crystal Growth," J. Mol. Biol., Vol. 299, Academic Press, 2000, pp. 725-735.	
	B12	DAI et al., "Phase Transformation, Coalescence, and Twinning of Monodisperse FePt Nanocrystals," Nano Letters, Vol. 1, No. 8, American Chemical Society, 2001, pp. 443-447.	
	B13	DAMERON et al., "Biosynthesis of Cadmium Sulphide Quantum Semiconductor Crystallites," Letters to Nature, Vol. 338, April 13, 1989, pp. 596-597.	
	B14	DOUGLAS et al., "Host-Guest Encapsulation of Materials by Assembled Virus Protein Cages," Letters to Nature, Vol. 393, Macmillan Publishers, Inc., 1998, pp. 152-155.	

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	B15	DOUGLAS et al., "Synthesis and Structure of an Iron (III) Sulfide-Ferritin Bioinorganic Nanocomposite," Science, Vol. 269, July 7, 1995, pp. 54-57.	
	B16	DOUGLAS et al., "Nanophase Cobalt Oxyhydroxide Mineral Synthesized Within the Protein Cage of Ferritin," Inorg. Chem., Vol. 39, American Chemical Society, 2000, pp. 1828-1830.	
	B17	DUJARDIN et al., "Organization of Metallic Nanoparticles Using Tobacco Mosaic Virus Templates," Nano Letters, Vol. 3, No. 3, American Chemical Society, 2002, pp. 413-417..	
	B18	FALINI et al., "Control of Aragonite or Calcite Polymorphism by Mollusk Shell Macromolecules," Science, Vol. 271, January 5, 1996, pp. 67-69.	
	B19	FLYNN et al., "Synthesis and Organization of Nanoscale II-VI Semiconductor Materials Using Evolved Peptide Specificity and Viral Capsid Assembly," Journal of Materials Chemistry, Vol. 13, The Royal Society of Chemistry, 2003, pp. 2414-2421.	
	B20	FOWLER et al., "Tobacco Mosaic Virus Liquid Crystals as Templates for the Interior Design of Silica Mesophases and Nanoparticles," Advanced Materials, Vol. 13, No. 16, Wiley-VCH, 2001, pp. 1266-1269.	

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	B21	JOSEPHSON et al., "High-Efficiency Intracellular Magnetic Labeling with Novel Superparamagnetic-Tat Peptide Conjugates," Bioconjugate Chem., Vol. 10, American Chemical Society, 1999, pp. 186-191.	
	B22	JUN et al., "Architectural Control of Magnetic Semiconductor Nanocrystals," JACS Articles, Vol. 124, No. 4, American Chemical Society, 2002, pp. 615-619.	
	B23	KANE et al., "Photoreactivity of Platinum (II) in Cisplatin-Modified DNA Affords Specific Cross-Links to HMG Domain Proteins," Biochemistry, Vol. 35, American Chemical Society, 1996, pp. 2180-2188.	
	B24	KANG et al., "Reduction of the fcc to L1 <sub>0</sub> Ordering Temperature for Self-Assembled FePt Nanoparticles Containing Ag," Nano Letters, Vol. 2, No. 10, American Chemical Society, October 2002, pp. 1033-1036.	
	B25	KOWSHIK et al., "Microbial Synthesis of Semiconductor PbS Nanocrystallites," Advanced Materials, Vol. 14, No. 11, Wiley-VCH, 2002, pp. 815-818.	
	B26	LEE et al., "Ordering of Quantum Dots Using Genetically Engineered Viruses," Reports, Science, Vol. 296, May 3, 2002, pp. 892-895.	

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	B27	LUPINKOVA et al., "Histidine Residue 252 of the Photosystem II DI Polypeptide Is Involved in a Light Cross-Linking of with the Polypeptide with the $\alpha$ Subunit of Cytochrome b-559: Study of a Site-Directed Mutant of Synechocystis PCC 6803," Biochimica et Biophysica Acta, Vol. 1554, Elsevier, 2002, pp. 192-201	
	B28	MALIK et al., "Role of Capsid Structure and Membrane Protein Processing in Determining the Size and Copy Number of Peptides Displayed on the Major Coat Protein of Filamentous Bacteriophage," J. Med. Biol., Vol. 260, Academic Press Limited, 1996, pp. 9-21.	
	B29	MANNA et al., "Synthesis of Soluble and Processable Rod-, Arrow-, Teardrop-, and Tetrapod-Shaped CdSe Nanocrystals," J. Am. Chem., Vol. 122, American Chemical Society, 2000, pp. 12700-12706.	
	B30	MAO et al., "Viral Assembly of Oriented Quantum Dot Nanowires," Proc. Nat. Acad. Sci., Vol. 100, No. 12, PNAS, 2003, pp. 6946-6951.	
	B31	MAO et al., "Virus-Based Toolkit for the Directed Synthesis of Magnetic and Semiconducting Nanowires," Reports, Vol. 303, January 9, 2004, pp. 213-217.	
	B32	MCCLELLAND et al., "Complete Genome Sequence of Salmonella Enterica Serovar Typhimurium LT2," Letters to Nature, Vol. 413, Macmillan Magazines, Ltd., 2001, pp. 852-856.	

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	B33	MOONEY et al., "Histidine Modifying Agents Abolish Pyruvate Dehydrogenase Kinase Activity," Biochemical and Biophysical Research Communications, Vol. 267, Academic Press, 2000, pp. 500-503.	
	B34	MUKHERJEE et al., "Fungus-Mediated Synthesis of Ag Nanoparticles and their Immobilization in the Mycelial Matrix: A Novel Biological Approach to Nanoparticle Synthesis," Nano Letters, Vol. 1, No. 10, American Chemical Society, 2001, pp. 515-519.	
	B35	NAIK et al., "Biomimetic Synthesis and Patterning of Silver Nanoparticles," Nature Material, Vol. 1, Nature Publishing Group, 2002, pp. 169-172.	
	B36	NAIK et al., "Silica-Precipitating Peptides Isolated From A Combinatorial Phage Display Peptide Library," Journal of Nanoscience and Nanotechnology, Vol. 2, No. 1, American Scientific Publishers, 2002, pp. 95-100.	
	B37	PARGE et al., "Structure of the Fibre-Forming Protein Pilin at 2.6 A Resolution," Articles, Nature, Vol. 378, November 1995, pp. 32-38.	

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	B38	PEREZ et al., "Viral-Induced Self-Assembly of Magnetic Nanoparticles Allowas the Detection of Viral Particles in Biological Media," J. Am. Chem. Soc., Vol. 125, American Chemical Society, 2003, pp. 10192-10193.	
	B39	PUNTES et al., "Colloidal Nanocrystal Shape and Size Control: The Case of Cobalt," Reports, Science, Vol. 291, March 16, 2001, pp. 2115-2117.	
	B40	SAKAGUCHI et al., "Magnetite Formation by a Sulphate-Reducing Bacterium," Letters to Nature, Vol. 365, September 2, 1993, pp. 47-49.	
	B41	SHENTON et al., "Synthesis of Nanophase Iron Oxide in Lumazine Synthase Capsids," Angew. Chem. Int. Ed., Vol. 40, No. 2, Wiley-VCH, 2001, pp. 442-445.	
	B42	SU et al., "Structural and Microstructural Characterization of the Growth Lines and Prismatic Microarchetecture in Red Abalone Shell and the Microstructures of Abalone Flat Pearls," Chem. Mater., Vol. 14, American Chemical Society, 2002, pp. 3106-3117.	
	B43	SUN et al., "Monodisperse FePt Nanoparticles and Ferromagnetic FePt Nanocrystal Superlattices," Reports, Science, Vol. 287, March 17, 2000, pp. 1989-1992.	

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Substitute for form 1449B/PTO <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>				<b>Complete if Known</b>		
				Application Number		10/665,721
				Filing Date		09/22/2003
				First Named Inventor		Angela M. BELCHER et al.
				Group Art Unit		1651
				Examiner Name		Unassigned
Sheet	7	of	7	Attorney Docket Number		027053-0107

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)				

NON PATENT LITERATURE DOCUMENTS			
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	B44	WARNE et al., Self Assembled Nanoparticulate Co:Pt for Data Storage Applications," IEEE Transactions on Magnetics, Vol. 36, No. 5, September 2000, pp. 3009-3011.	
	B45	WHALEY et al., "Selection of Peptides with Semiconductor Binding Specificity for Directed Nanocrystal Assembly," Letters to Nature, Vol. 405, Macmillan Magazines, Ltd., June 2000, pp. 665-668.	
	B46	WONG et al., "Biomimetic Synthesis of Cadmium Sulfide-Ferritin Nanocomposites," Adv. Mater., Vol. 8, 1996, pp. 928-932.	
	B47	ZAREMBA et al., "Critical Transitions in the Biofabrication of Abalone Shells and Flat Pearls," Chem. Mater., Vol. 8, American Chemical Society, 1996, pp. 679-690.	

Examiner Signature	Date Considered
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